LISTING OF THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) An apparatus, comprising:

a collector electrode of conductive material;

a first charge movement barrier layer electrically contacted with said collector electrode;

a nano-particles layer in which a plurality of conductive and of a predetermined minute size, nano-particles that are insulated from each other~~, and~~ are arranged as a ~~mono layer and~~ substantially regularly and uniformly dispersed single layer and have electrical contact with said first charge movement barrier layer;

a first semiconductor layer contacted with said nano-particles through a medium of a rectifying barrier of a predetermined depth; and

a source electrode of conductive material electrically contacted with said first semiconductor layer,

wherein a plurality of nano-sized rectifying devices formed by said first nano-particles layer and said first semiconductor layer have electrical connections in parallel with said collector electrode through said first charge movement barrier, each of said rectifying devices serving as an electrically dependent rectifying device, and

wherein by means of unit charges (1.602×10^{-19}C) coming in and out of said nano-particles and confined by a barrier, and generating irregular AC potential by heat on respective said nano-particles, ambient temperature of said apparatus in a thermal equilibrium state is converted by itself so that said apparatus continuously produces DC electromotive force.

2. (Previously Presented) The apparatus of claim 1, wherein said collector electrode, said source electrode and said nano-particles are made of metal or its equivalent material, respectively.

3. (Previously Presented) The apparatus of claim 1, wherein said first semiconductor layer is a P-type semiconductor.

4. (Previously Presented) The apparatus of claim 1, wherein said semiconductor layer is an N-type semiconductor.

5. (Previously Presented) The apparatus of claim 1, further comprising a second nano-particles layer equivalent with said first nano-particles layer and a second semiconductor layer having a carrier type opposite to that of said first semiconductor layer and inserted between said first charge movement barrier layer and said collector electrode, so that said apparatus has P-type and N-type conductive structures sharing said first charge movement barrier layer, connected serially with each other, and between said collector electrode and said source electrode.

6. (Previously Presented) The apparatus of claim 1, further comprising a second semiconductor layer having a carrier type is opposite to that of said first semiconductor layer and inserted between said first charge movement barrier layer and said collector electrode, so that said apparatus has P-type and N-type conductive structures which shares said first nano-particles layer and are connected serially with each other.

7. (Previously Presented) The apparatus of claim 1, further comprising an ohmic layer between said first semiconductor layer and said source electrode.

8. (Previously Presented) The apparatus of claim 1, wherein said first charge movement barrier layer is made from material capable of providing tunneling effect or resistor material so as to prevent said plurality of nano-particles from having direct electrical connections with each others through said collector electrode.

9. (Previously Presented) The apparatus of claim 1, wherein said first charge movement barrier layer has incomplete conductive state with both a barrier property and a conduction property, said barrier property preventing said plurality of nano-particles from having direct electrical connections with each other through said collector electrode and attributing to generation of the irregular AC potential on respective nano-particles which the unit charge comes in and out, and said conduction property allowing said rectifying devices to have electrical connections in parallel with said collector electrode through said first charge movement barrier.

10. (Previously Presented) A method of obtaining a desired DC electromotive force, by using said apparatus of claim 1, and by allowing, at an ambient temperature of said apparatus, among unit charges, only the unit charges with such high energy by which they can go over a barrier determined by carrier density of said first semiconductor layer, size (being able to be represented as area S) of said nano-particles, depth L1 of said charge movement barrier layer, and depth L2 of said rectifying barriers, so as to generate irregular AC potential on said nano-particles.